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10/043,534	01/10/2002	Homer Chou	00044X215193	6245

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EXAMINER

VINH, LAN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 03/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/043,534

Applicant(s)

CHOU ET AL.

Examiner

Lan Vinh

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 13 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-3,5,6 and 9-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,5,6 and 9-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/13/2006 has been entered.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-3, 6, 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Ohashi et al (US 6,190,443)

Ohashi discloses an aqueous polishing composition and a polishing system for CMP a substrate. The polishing composition includes water/liquid carrier (col 6, lines 20-22), a polishing pad and abrasive (col 8, lines 1-2; col 9, lines 21-35), fumed silica (col 3,

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lines 60-65), ammonium oxalate (col 5, lines 41-43), hydroxyethylethyl/ hydroxyl coupling agent (col 4, lines 30-36). Ohashi is silent about the use of an oxidizing agent

Regarding claims 2-3, Ohashi discloses that ethanol/non-aqueous solvent and water can be added to the composition (col 6, lines 20-41)

Regarding claim 6, Ohashi discloses dispersing the abrasives/silicon dioxide/silica in water/liquid carrier (col 6, lines 16-22)

Regarding claim 15, Ohashi discloses that the polishing composition has a pH range from 8-9 (col 6, lines 56-58)

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3, 5-6, 10-13, 15-18, 20-24, 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motorani et al (US 6,447,695) in view of Sinha et al (US 6,551,935)

Motorani discloses an aqueous dispersion composition and a polishing system for CMP a substrate. The polishing system includes water/liquid carrier (col 2, lines 55-57), a polishing pad and abrasive (col 10, lines 21-23; col 3, lines 49-50), fumed silica (col 3, lines 49-54; Table 1), a hydroxyl coupling agent (col 4, lines 30-36). Motorani also discloses that the aqueous dispersion composition for CMP contains no oxidizing agent,

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the pH of the aqueous dispersion may be adjusted (col 6, lines 25-60), and various additives can be included in the composition (col 7, lines 5-6)

Unlike the instant claimed invention as per claim 1, Motorani fails to disclose using ammonium oxalate in the aqueous dispersion composition

Sinha discloses a method for using a planarizing solution comprises the step of using ammonium oxalate in an aqueous polishing composition employed in a polishing system includes a polishing pad and abrasives (col 5, lines 14-18; col 6, lines 15-20)

Since Motorani is directed to a polishing system for polishing metal using an aqueous dispersion composition/slurry that includes additive, one skilled in the art at the time the invention was made would have found it obvious to modify Motorani composition by adding ammonium oxalate in the aqueous dispersion composition as per Sinha because Sinha discloses that one or more buffers such as ammonium oxalate may be used to adjust the pH of the slurry to a desired level (col 6, lines 7-10)

Unlike the instant claimed invention as per claim 5, Motorani fails to disclose using a fixed abrasive polishing pad

Sinha also discloses using a fixed abrasive polishing pad in one of the embodiment (col 8, lines 33-34)

Hence, one skilled in the art at the time the invention was made would have found it obvious to modify Motorani polishing system by using a fixed abrasive polishing pad as per Sinha because Sinha discloses that clean pre-operative sections of the fix-abrasive pad may be quickly substituted for used sections to provide a consistent surface for planarizing (col 8, lines 38-42)

The limitations of claims 2-3, 6 have been discussed above

Regarding claims 10-12, Motorani discloses using benzotriazole in the aqueous dispersion composition (col 6, lines 4-5)

Regarding claim 13, Motorani discloses using a silane-containing compound (col 4, lines 31-34)

Regarding claim 16, Motorani discloses that the pH of the composition is 1-9 (col 6, lines 30-31)

Regarding claims 17-18, 20-24, 26-27, Motorani discloses polishing a substrate comprises Cu, Ta and TEOS wherein the Cu:TEOS removal rate is approximately 0.56/1:2 (Table 1)

6. Claims 9, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motorani et al (US 6,447,695) in view of Sinha et al (US 6,551,935) and further in view of Allman et al (US 6,541,383)

Motorani as modified by Sinha et has been described above. Unlike the instant claimed invention as per claims 9, 14, Motorani and Sinha fail to specifically using ureidopropyltrimethoxylane as the hydroxyl agent

Allman discloses a method for polishing a semiconductor wafer comprises the step of using ureidopropyltrimethoxylane in the aqueous polishing composition (col 7, lines 30-34)

Hence, one skilled in the art at the time the invention was made would have found it obvious to modify Motorani and Sinha by using ureidopropyltrimethoxylane in the

aqueous polishing composition as per Allman because Allman discloses that organofunctional silane such as ureidopropyltrimethoxylane can be utilized as adherence promoting ligands in the polishing composition (col 7, lines 10-13)

7. Claims 19, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motorani et al (US 6,447,695) in view of Sinha et al (US 6,551,935) and further in view of Ni (US 6,503,766)

Motorani as modified by Sinha et has been described above. Unlike the instant claimed invention as per claims 19, 25, Motorani and Sinha fail to disclose the specific removal rate ratio of the Cu and Ta layer

Ni, in a method for CMP, discloses that a polishing rate can be optimized by adjusting a polishing parameter such as polishing agent flow (col 6, lines 3-7)

Thus, one skilled in the art at the time the invention was made would have found it obvious to modify Motorani and Sinha by adjusting the polishing agent flow to optimize the removal rate because Ni discloses that the polishing rate is a result-effective variable in the same field of endeavor

### ***Response to Arguments***

8. Applicant's arguments filed 3/13/2006 have been fully considered but they are not persuasive.

The applicants argue that while Motonari (695) patent refers to silica, it does not refer to fumed silica. This argument is unpersuasive because as recited in col 3, lines 49-54

and Table 1 of Motonari, fumed silica is used in the aqueous composition. This argument is also moot in view of the new ground of rejection of claim 1 under 35 U.S.C 102(e) based on the newly cited reference of Ohashi et al (US 6,190,443) that discloses the use of fumed silica

The applicants argue that nowhere within the disclosure of the Motonari (695) patent is there a teaching or suggestion of an aqueous dispersion comprising both silica and a hydroxy coupling. This argument is unpersuasive because as recited in col 8, lines 12-30; 45-50 of Motorani, Motorani discloses adding methyltrimethoxysilane/hydroxyl to the aqueous dispersion containing silica particles. For the above-mentioned reasons, the rejection(s) of claims 1-3, 10-13, 15-27 under U.S.C 103(a) based on Motorani and Sinha is maintained in this office action

It is argued that nothing within the Allman :383 patent teaches or suggest a polishing composition comprising an adherence promoting ligand such as ureidopropyltrimethoxylane in combination with fumed silica and with ammonium oxalate. In response, Allman is relied upon to teach using ureidopropyltrimethoxylane in the aqueous polishing composition, and is not relied upon to teach a combination of ureidopropyltrimethoxylane with fumed silica and with ammonium oxalate. The reference of Motorani and Sinha teach the combination of fumed silica and ammonium oxalate.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning.



But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

### ***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 571 272 1471. The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571 272 1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
LV

March 27, 2006